## 4.3 INDIRECT AND CUMULATIVE EFFECTS

Potential indirect and cumulative effects of the US 8 EIS alternatives are important to address just as the direct effects have been in previous sections of this document. Unlike direct effects that are typically measured through methods that tend to reveal very quantifiable results, indirect and cumulative effects often include more qualitative measures because of the level of uncertainty that surrounds land use changes in relation to transportation improvements. This can be demonstrated in how indirect and cumulative effects are defined. The Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1508.8) defines indirect effects:

"Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and the related effects on air and water and other natural systems, including ecosystems."

Examples of indirect effects include new development and land use changes such as residential, commercial, and industrial development that could occur due to highway improvements. They also include the associated changes in population density from additional residents and labor, and any effects to natural features from the land use change. When an improvement action enables indirect effects, it does not directly cause the change, but along with other factors, it helps to provide more opportunities for change.

US 8 EIS alternatives may potentially cause indirect effects through improvements to access and mobility, but it is important to note that transportation improvements are one of many factors that influence land use decisions and development patterns. A graphical depiction of the factors that influence changes in land use is shown in Figure 4.3-1.

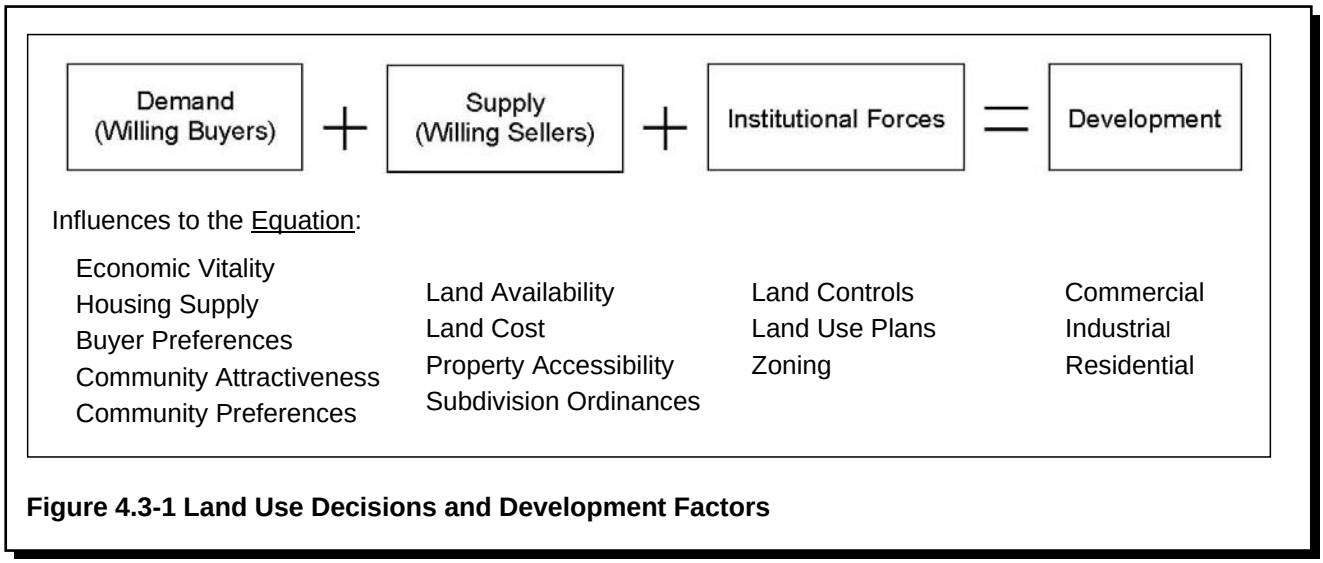



**Figure 4.3-1 Land Use Decisions and Development Factors**

Other factors that influence land use include the supply and demand of developable land (a fixed resource), institutional factors such as land use controls (zoning, subdivision ordinances, etc.), and the vitality of the economic environment. In order for development to occur, demand for developable land, supply of that land, and institutional forces that are compatible with the type of desired development must all be present. A majority of these factors are present along the US 8 corridor and surrounding areas.

Cumulative effects in this document also follow the Council on Environmental Quality (CEQ) regulations (40 CFR § 1508.7) and are defined as: "…the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." The discussion of cumulative effects is found in Section4.3.4.

### 4.3.1 Current Trends

Current trends provide a baseline in determining the potential magnitude of indirect and cumulative effects that could result from transportation improvements such as the US 8 EIS alternatives. A summary of the existing trends for residential, commercial, and industrial development are provided in the following sections. In addition, the existing relationships of development patterns on the natural and agricultural land resources are also examined in this section. Section 3.0 provides a detailed evaluation of many of the existing resources present within the study area and should also be referenced for further information.

#### 4.3.1.1 Residential

All but one jurisdiction in the study area (town of Barron) experienced an increase in population between 1990 and 2000 and half of the communities had a population growth greater than 10 percent. Barron and Polk Counties had an average growth rate ranging from 10–19 percent over the same period, with the state average also around 10 percent. Communities with the greatest growth in the project area tend to have more rural characteristics. Table 4.3.1.1-1 shows the historical population growth rates between 1990 and 2000 within the study area.

**Table 4.3.1.1-1**

**Population Change in US 8 Study Area**

| Study Area Community | Actual Census Population | | % Increase 1990-2000 | Projected Population | |
|---|---|---|---|---|---|
| | 1990 | 2000 | | 2010 | 2020 |
| Town of Almena | 773 | 910 | 17.7% | 1,003 | 1,085 |
| Town of Apple River | 815 | 1,067 | 30.9% | 1,220 | 1,347 |
| Town of Balsam Lake | 1,067 | 1,384 | 29.7% | 1,592 | 1,766 |
| Town of Barron | 1,015 | 1,014 | -0.1% | 988 | 984 |
| Town of Beaver | 663 | 753 | 13.6% | 846 | 922 |
| Town of Clayton | 780 | 912 | 16.9% | 984 | 1,039 |
| Town of Clinton | 849 | 920 | 8.4% | 967 | 1,005 |
| Town of Maple Grove | 926 | 968 | 4.5% | 953 | 932 |
| Town of St. Croix Falls | 1,034 | 1,119 | 8.2% | 1,248 | 1,354 |
| Town of Stanley | 2,087 | 2,229 | 6.8% | 2,376 | 2,492 |
| Town of Turtle Lake | 621 | 622 | 0.2% | 609 | 593 |
| Village of Almena | 625 | 720 | 15.2% | 791 | 852 |
| Village of Turtle Lake | 817 | 1,065 | 30.4% | 1,151 | 1,263 |
| City of Barron | 2,986 | 3,248 | 8.8% | 3,483 | 3,656 |
| **Study Area Total:** | **15,058** | **16,931** | **12.4%** | **18,211** | **19,290** |
| Barron County | 40,750 | 44,963 | 10.3% | 47,401 | 49,386 |
| Polk County | 34,773 | 41,319 | 18.8% | 45,901 | 49,592 |

Source: Department of Administration Demographic Services Center

If future population increases follow the historical trend, growth rates are projected to be significantly lower for the majority of the study area than they were for the period between 1990 and 2000. Overall, the study area is expected to have a growth rate of roughly 7.4 percent between 2000 and 2010 which is 4.7 percent lower than it was for the ten year period between 1990 and 2000.

Communities in the study area have also experienced growth in the number of housing units between 1980 and 2000. Housing unit growth is often a better indicator of actual land use change than population growth. Increases in the number of housing units are consistent with changes in population growth. All communities in the project area had housing unit growth, indicating that residential development pressures are present throughout the area. The greatest changes in housing occurred in communities surrounding the incorporated areas. These urban and suburban areas are served by public sanitary sewer systems and contain a full range of land use types. Table 4.3.1.1-2 shows the increase in housing units for the study area communities.

**Table 4.3.1.1-2**

**Growth in Housing Units in US 8 Study Area**

| Study Area Community | Housing Units | | | % Increase | |
|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 1980-1990 | 1990-2000 |
| Town of Almena | 522 | 609 | 688 | 16.7% | 13.0% |
| Town of Apple River | 488 | 570 | 625 | 16.8% | 9.6% |
| Town of Balsam Lake | 730 | 906 | 1,018 | 24.1% | 12.4% |
| Town of Barron | 329 | 323 | 331 | -1.8% | 2.5% |
| Town of Beaver | 373 | 419 | 441 | 12.3% | 5.3% |
| Town of Clayton | 340 | 371 | 412 | 9.1% | 11.1% |
| Town of Clinton | 312 | 332 | 385 | 18.5% | 10.7% |
| Town of Maple Grove | 324 | 337 | 347 | 4.0% | 3.0% |
| Town of St. Croix Falls | 410 | 486 | 538 | 18.5% | 10.7% |
| Town of Stanley | 663 | 805 | 911 | 21.4% | 13.2% |
| Town of Turtle Lake | 217 | 263 | 281 | 21.2% | 6.8% |
| Village of Almena | 238 | 270 | 304 | 13.4% | 12.6% |
| Village of Turtle Lake | 325 | 394 | 473 | 21.2% | 20.1% |
| City of Barron | 1,083 | 1,283 | 1,416 | 18.5% | 10.4% |
| **Study Area Total:** | **6,354** | **7,368** | **8,170** | **16.0%** | **10.9%** |
| Barron County | 17,153 | 19,363 | 20,969 | 12.9% | 8.3% |
| Polk County | 16,226 | 18,562 | 21,129 | 14.4% | 13.8% |

Source: U.S. Census Bureau

### 4.3.1.2 Commercial/Industrial

In Polk and Barron Counties, existing transportation facilities have influenced the type and location of commercial development. In the city of Barron, US 8 has stimulated linear development along the highway, somewhat diluting the central business district into a longer business corridor, especially on the eastern side of the city. In the village of Turtle Lake the central business district has been shifted north from the previous location of the US 8 corridor. In both communities, the number of highway dependent businesses has also increased including chain fast food restaurants and convenience stores/gas stations.

The area's natural amenities (lakes and rivers) and tourism opportunities, such as the St. Croix Casino, will continue to draw visitors. These opportunities may lead to further growth in tourist- and service-oriented establishments.

Industrial development has experienced growth in the study area. The city of Barron created its industrial park in 1970 and has been actively growing its industrial space with plans to add additional acreage to the park. The village of Turtle Lake industrial park is located in Polk County portion of the village and has land available for development.

### 4.3.1.3 Agriculture

Agriculture has substantial economic importance for both Polk and Barron Counties (see Section 3.1.3.8). Roughly 68 percent of soils in Barron County and 56 percent of soils in Polk County are considered prime agricultural soils that can support agricultural operations. Population and housing growth in area towns indicate there is development pressure on farmland. Most of the towns in the study area experienced substantial growth in both population and housing. Between 1992 and 1997, land in farms decreased by 7 percent in Barron County and 5 percent in Polk County according to the 1997 agricultural census. Between 1987 and 1997, the number of active farms has also decreased by 15.5 percent as well (see Section 3.1.3.8). Agricultural zoning regulations indicate the local commitment to agricultural land use. Both Barron and Polk Counties protect farmland through exclusive agriculture zoning ordinances. This zoning category severely limits nonagricultural uses such as rural residential or commercial development in those areas.

#### 4.3.1.4 Natural Environment

As discussed in Section 4.3.1.1, residential development has been increasing in rural areas of the project area. Current land use controls do not have a substantial impact on the size or location of development in rural areas where natural areas are also typically located. Resources such as wetlands carry state and federal protection, however, woodlots and prairies typically are not granted the same protection. Under the current Barron and Polk County Zoning and Subdivision Ordinances, typical rural residential development can occur on lots as small as 1.5 acres (0.6 ha) with larger lot sizes common depending on the zoning in place.

### 4.3.2 Indirect Effects

#### 4.3.2.1 Methodology of Indirect Effects Analysis

The relationship between transportation improvements and indirect effects is a controversial one. Because of this, no standardized quantitative approach is recommended by FHWA. However, interim guidance is provided by FHWA in the National Cooperative Highway Research Program (NCHRP) Report 403 in the form of questions and answers that address the estimation of the indirect and cumulative effects of transportation projects. The interim approach includes an 8 step process for analyzing indirect effects that is similar to the approach used for the US 8 EIS. Because there is great variation to the degree that groups and studies link transportation improvements to land use change, the definition, relationship, and analysis methodology are anticipated to continue to evolve.

Predicting indirect effects includes a certain level of uncertainty. However, a familiarity with local land use controls, planning efforts, and existing development trends can minimize the uncertainty. For this reason, the ultimate analysis methodology selected for the US 8 EIS was based on ideas that were conceptualized during a workshop held by the EPA and WisDOT in 2003. At the time of the analysis, comprehensive planning in the project study area was limited, GIS data was either unavailable or inconsistent, and there were no land use models established by regional planning agencies. Based on these conditions, a qualitative analysis was recommended through workshop participants and developed for the US 8 EIS indirect effects analysis.

The analysis included the development and use of two Expert Panels, two Delphi Survey groups, and further analysis by the study team. Each Expert Panel was developed to focus on the potential effects on the city of Barron and the village of Turtle Lake. The Delphi Surveys considered the entire US 8 corridor and were divided into two groups, one group considered Barron County and the other considered Polk County.

The Expert Panels were composed of local community leaders including municipal staff, elected officials, business owners, farmers, Native Americans, and interested citizens. The strength of the Expert Panels was the wealth of knowledge that the participants possessed about the local area and brought forth into the analysis. Because quantitative data was not readily available, the Expert Panels relied on their own local knowledge about land use regulations and growth trends to identify the potential ramifications of the US 8 EIS alternatives. Each Expert Panel group met three times in their respective communities.

Delphi Survey participants included county supervisors, town chairs and supervisors, MnDOT staff, business owners, local agency/department heads, farmers, regional planning commission representatives, and town/city/village officials, among others. The survey participants never met as a group and remained anonymous throughout the process as they carried out their analysis via a series of three mailed surveys.

The Expert Panels and Delphi Survey participants (EP/DS) were both given background information pertaining to the US 8 corridor including land use plans and regulations, housing trends, employment trends, population projections, economic trends, location of municipal services, natural resources, and other project background information resources.

The EP/DS spent a significant amount of time determining future land use trends through interactive mapping exercises. In the exercises, the groups identified locations they felt future residential, commercial, industrial, and institutional land uses would experience the greatest growth under the no-build conditions. The no-build land use scenario was then used by the EP/DS as a baseline to identify and compare indirect land use effects induced by the various US 8 EIS build alternatives. The results from both groups were combined to create a composite set of maps. The maps depicted where the groups thought land would develop for each of the proposed alternatives. Indirect effects of the alternatives on land uses identified by the EP/DS are compiled and shown in Figure 4.3.2.1-1.

The following sections summarize the indirect effects analysis of residential, commercial, and industrial development for the project study area. Findings from the EP/DS groups and the analysis of the study team are provided as separate sections for each land use type. Figure 4.3.2.1-1 can be reviewed to identify specific locations where the EP/DS felt residential, commercial, and industrial development was most likely to occur. The EP/DS mapping exercise was also used to estimate the indirect effects on environmental resources. The analysis was conducted by the study team using GIS and overlaying the future land uses identified from the mapping exercises on existing wetlands, agricultural land, and open space/woodlots. The results of the analysis are tabulated in Appendix H. In addition, the study team further analyzed indirect effects to agriculture and the natural environment (sections 4.3.2.5 and 4.3.2.6).

### 4.3.2.2 Residential Development

A. Findings from Expert Panels and Delphi Surveys (EP/DS)

The EP/DS felt that the US 8 EIS alternatives could spur additional residential development throughout the project area. In rural areas, residential development could occur where adequate land is available near lakes and other natural amenities. Near urban areas such as the village of Turtle Lake and the city of Barron, it would mostly likely occur near the fringe of the community with the exact location gravitating toward the ultimate Preferred Alternative.

For much of the study area, the current levels of planning and land use controls make it difficult for local governments to have a strong influence on the location or type of residential development. This current level is anticipated to change with the completion of the recent comprehensive planning efforts in Barron County. Polk County adopted its land use plan in October 2002. Land use controls would also be updated to support community comprehensive plans.

B. Findings from Study Team Analysis

Highway improvements may enhance residential housing growth and development along US 8 by both increasing the area's accessibility and by contributing to the overall local economy. However, specific locations of this development are currently unknown. Highway improvements have the potential to affect the local economy through improved access to market areas, improving the efficiency of transporting agricultural goods and other commodities between regional market centers, and providing safer access to businesses and commercial operations. An improved economy would require an enlarged workforce. This workforce would need housing, increasing residential demand, and facilitating development.

The current local land use controls and policies in place allow for low-density, large-lot, single-family development to occur in many parts of the study area. Current limitations in subdivision and zoning ordinances could allow for large blocks of residential development to occur in the expanded commuter sheds of St. Croix Falls, Rice Lake, Barron, and Turtle Lake. If the current planning and zoning environment does not change, US 8 improvements could influence the distribution of new residential development within the study area by improving access and mobility to certain areas. It is likely, however, that ongoing local comprehensive planning efforts and associated changes in land use controls will have a greater effect on the distribution of residential development over what currently exists.

In general, current population and housing trends are expected to continue. However, where any residential development would occur is highly speculative. Generally, parcels immediately adjacent to potential bypass alternatives may be less desirable because of highway noise and related nuisances. Where the alternatives follow the existing alignment, there may be pressure on existing residential development to convert to commercial uses near major intersections or interchanges. Generally, land that can be connected to municipal water and sewer service areas has a greater potential for higher density residential development than in rural areas along US 8. The trend of residential development occurring near lakes and other natural features is also expected to continue due to the higher value placed on these amenities. Scattered residential development on agricultural lands is expected to continue throughout the project study area over time, but is not attributed to indirect effects of proposed project improvements.

The potential US 8 EIS alternatives could play a stronger role in shaping the location of, rather than the quantity of, future residential development in the project study area. Effective land use plans and policies would control undesirable locational effects. However, the current levels of local planning and zoning would not prevent these effects. Areas that could experience increased residential development as a result of the project alternatives include the vicinity of the US 8/WIS 46 (N) intersection, near Brusher Lake, Twin Lakes, along bypass locations of the village of Turtle Lake, along the southeast side of the village of Almena, and the at the fringes of the city of Barron.

#### 4.3.2.3 Commercial Development

A. Findings from Expert Panels and Delphi Surveys (EP/DS)

New commercial development could be concentrated at intersections and/or interchanges with state highways and county roads as a result of the various US 8 EIS build alternatives. The EP/DS felt that commercial development would be likely to occur at these locations due to the high traffic volumes, prominent visibility for automobile traffic, and access from the transportation system. Where villages and cities may be bypassed (Deer Lake, Range, Turtle Lake, Poskin, and Barron off-alignment alternatives), it was felt that commercial development could occur near proposed interchanges. Linear or strip development would likely be limited along these bypass corridors because of the access-controlled nature of the new alignments.

The EP/DS members identified two locations near the village of Turtle Lake that could see increased commercial development. Potential development could be closely aligned with the location of southern bypass interchanges (Alternatives 1 and 2). The village of Almena and the unincorporated community of Poskin could see increased or relocated commercial development as developers look to take advantage of the high traffic volumes and potential customer base that US 8 provides. The city of Barron could experience commercial development occur on the eastern and western fringes of the community and near interchanges. The EP/DS felt that this is likely to occur because land on the periphery of the city is more abundant, less expensive, and generally easier to develop than land within the city. Additionally, development located at the edges of Barron and near the interchanges could receive increased exposure from US 8 traffic, whether on the existing route or the bypass.

B. Findings from Study Team Analysis

Generally, the effect of the US 8 EIS alternatives on commercial development in the area is anticipated to be limited. This estimation is based on the project study area's position relative to other regional economic centers. The city of Rice Lake is already experiencing increased commercial development. In addition, the city of St. Croix Falls located just west of the project study area has an established commercial strip. These two commercial areas, combined with their close proximity to each other and the limited spending power of the region, may restrain the likelihood of substantial commercial development stimulation from the highway improvements.

The US 8 project could have a role in shaping the location of, rather than the quantity of, commercial development in the project study area. Corridor preservation activities in later EIS Tiers such as direct purchase of access, consolidation, and other access management initiatives could limit widespread commercial strip development. Access management along the corridor would likely result in concentrating commercial development in higher densities at or near access points along US 8 such as at intersections and interchanges similar to the development patterns expected along the bypass alternatives. The areas where commercial development could experience increases include: the US 8/WIS 35 (N) interchange, US 8/WIS 65 and US 8/WIS 46 (N) intersections, US 8/WIS 46 (S) and US 8/County E intersections, and the village of Almena. In addition, commercial development could shift from locations within the village of Turtle Lake and city of Barron to bypass locations. Effective local land use controls and policies could help manage undesirable locational effects.

#### 4.3.2.4 Industrial Development

A. Findings from Expert Panels and Delphi Surveys (EP/DS)

The EP/DS felt that industrial development would most likely follow existing trends, regardless of US 8 EIS alternatives. The village of Turtle Lake and the city of Barron currently have vacant industrial park space that is available for development. The EP/DS revealed that local officials do not expect an improved transportation facility to substantially effect industrial development. Therefore, the anticipated shift in the location or pace of industrial development is expected to be minor in nature.

B. Findings From Study Team Analysis

Industrial development within the study area is primarily located in the village of Turtle Lake and the city of Barron where municipal services can support this type of land use. To date, industrial development in the village of Turtle Lake has been limited. None of the alternatives are expected to substantially affect the rate or location of industrial development in the vicinity of the village.

The city of Barron's industrial park already has convenient access to both US 8 and US 53 (an existing four-lane facility). The industrial park has available space for development and expansion plans to make more land available. The available space at the industrial park coupled with its already high level of access and mobility reduces the influence of the potential alternatives to have wide-spread effects to industrial development in the vicinity of the city.

#### 4.3.2.7 Summary of Indirect Effects

The pattern of development that is anticipated to occur in the project study area with the US 8 EIS alternatives would most likely be similar to the current pace and type occurring now. Commercial/industrial development would likely continue to be concentrated in urban areas. Some development could shift to the intersections and/or interchanges with other highways with the US 8 bypass alternatives. Residential development would likely continue in rural and urban fringe areas. With changes in comprehensive planning and land use controls anticipated for some communities adjacent to the corridor, potential land use changes could be substantially different (type, location, pace, etc.) than those identified by the EP/DS mapping exercises.

The potential for increased development could cause a decrease in the amount of agricultural and other lands currently in natural use. In general, indirect effects of US 8 EIS build alternatives would decrease agricultural land proportional to the amount of residential and commercial/industrial development that could occur. In most instances, as areas of development increase, agricultural land decreases, especially in communities where increased density is not being promoted. Indirect effects could occur at or near new interchange locations which could reduce agricultural land at these locations.

Other areas surrounding the project corridor include areas of numerous natural and recreational resources (see Section 3.1.3). These resources include lakes, streams and rivers, community parks and recreation areas, wildlife areas, bogs, wetlands upland prairies, open spaces, and wooded areas. Similar to agricultural land, indirect effects of the US 8 EIS alternatives would generally be related to the amount of residential, commercial, and industrial development that occurs and the location of development. Residential development may have a slightly greater influence on natural resources due to the desirability of locating near these resources.

### 4.3.3 Mitigation of Indirect Effects

There are five general categories of actions that can be used by a variety of government entities to avoid, minimize and potentially mitigate indirect effects associated with transportation improvements such as those proposed by the US 8 EIS. These actions include education, comprehensive planning, regulatory tools, access management, and property acquisition. Each of these actions has been or may be used within the project study area. A comprehensive list of policy tools and their desired effects is included in Appendix H.

### 4.3.3.1 Education

A. Education Efforts to Date

In order for land use mitigation efforts to be effective, property owners, businesspersons, and local officials must understand the basics of comprehensive planning and the relationship between transportation improvement projects and land use. Until recently, most of the comprehensive planning efforts within the project study area were undertaken at the county level with the assistance of the West Central Wisconsin Regional Planning Commission (WCWRPC). Local communities had involvement in the process, but they have not addressed local development issues through the implementation of local comprehensive or land use plans.

The countywide planning approach to development issues may create consistency on a regional and/or countywide scale, but the process is often difficult to implement at the community level where land use development decisions are made. Recently, the local approach to planning has begun to change with many Barron County communities and the WCWRPC undertaking a comprehensive planning process that complies with state "Smart Growth" requirements. Under the state requirements, local communities provide substantially more guidance into local comprehensive planning than in the past. Many of the Barron County project study area communities are currently developing local comprehensive plans. In fact, many of the communities in the project study area are in a strategic position to address the effects that transportation improvements could have on local land use development patterns.

The indirect and cumulative impacts analysis participants included many area local officials, businesspersons, and residents who are actively involved in their communities. As part of the analysis process, they received printed educational materials explaining the transportation and land use relationship. This information was designed to help them understand how the potential highway improvements could impact land use and development and how future land use decisions could impact transportation facilities. The analysis participants also received a packet of information that specifically addressed community-level mitigation strategies. The strategies included varied in scope from very general concepts, such as developing an agricultural land preservation plan, to very specific techniques, such as the development of impact fees for development projects.

B. Potential Future Education Efforts

Additional educational efforts may be beneficial and would most likely arise out of comprehensive planning efforts. Communities participating in these efforts will need to consider the potential effects of transportation improvements on land use and identify strategies to address the effects. Once strategies are identified, institutional mechanisms will need to be formulated according to the local comprehensive plan. In these upcoming efforts, information about the transportation improvements planned for US 8 would be beneficial to local planning, as it becomes available. Information sharing between local communities and WisDOT would support the effectiveness in local comprehensive planning efforts.

C. Commitment to Additional Education

WisDOT is committed to education as it pertains to prolonging and preserving the effective life of transportation improvements. Local planning efforts that are developed with the appropriate knowledge of the transportation/land use relationship will help maintain the infrastructure investment. To this end WisDOT is committed to working with local communities to ensure that they are planning with the latest information available pertaining to US 8.

### 4.3.3.2 Comprehensive Planning

A. Comprehensive Planning Efforts to Date

In Wisconsin, local governments are authorized to adopt and implement the vast majority of land use related planning and regulatory powers. As discussed in Section 3.3.2.2, local planning efforts have been primarily undertaken at the county level. County plans guide decisions in the unincorporated areas of the county. Polk County adopted its land use plan in 2002 and Barron County currently has

a land use plan that was adopted in 2001. The only other community in the project area to have completed a land use plan is the town of Clayton.

B. Potential Future Comprehensive Planning Efforts

In 2003, Barron County began a multi-jurisdictional comprehensive planning effort with the cities of Chetek and Cumberland, villages of Almena and Turtle Lake, and the towns of Almena, Barron, Bear Lake, Chetek, Crystal Lake, Dovre, Doyle, Maple Plain, Prairie Lake, Sioux Creek, Stanfold, Stanley, and Sumner. As part of the transportation element of the comprehensive plan, US 8 transportation improvements and any other transportation plans will need to be incorporated and/or amended to the final plan. To satisfy the intergovernmental component of the plan, local communities engaged in the planning process would need to coordinate with WisDOT.

The comprehensive planning effort underway in Barron County also includes a highly participatory public involvement plan designed to engage a wide variety of stakeholders. One of the objectives of the public participation plan is to educate residents about comprehensive planning and the interrelated nature of many community decisions. Development can impact many facets of a community including schools, social services, tax rates, and the transportation system. In part, the comprehensive planning process would continue the education process that was started in the indirect and cumulative impact analysis but will do so with a larger audience.

C. Commitment to Planning Efforts

Currently, WisDOT and the local jurisdictions have identified no additional planning efforts other than the US 8 EIS and the indirect and cumulative impact analysis. Once a Preferred Alternative is selected, it is possible that other local governments may be interested in more intensive planning for the expected changes. All local governments can help preserve right-of-way for the selected corridor by completing comprehensive plans, updating zoning ordinances, and through official mapping.

#### 4.3.3.3 Regulatory Tools

A. Regulation Efforts to Date

In Wisconsin, most land use regulatory powers are exercised by local jurisdictions through zoning and other ordinances. In the project area, most local communities have zoning ordinances in place. Zoning is the most used regulatory tool that local communities are using to control land use. The village of Turtle Lake and city of Barron use other ordinances to a greater degree than the rural communities to control urban development patterns. Impact fees and transportation utilities are tools that communities can potentially use to identify and offset the costs of infrastructure related to new development.

B. Potential Future Planning Efforts

Future efforts could specifically address regulations on the location, type, density, and mitigation of site-specific development impacts. Additional regulatory efforts would affect the impact of development on the lifespan of US 8 improvements. Future efforts should support the local planning initiatives described earlier. Regulatory tools should also have the flexibility to respond to transportation improvements. WisDOT can also continue its access management and subdivision review process through the powers that it is granted.

C. Commitment to Planning Efforts

In Wisconsin, the state has few statutory powers to regulate land use patterns and development. Local jurisdictions are the primary administrators of land use planning and regulation activities and make all development decisions. Strengthening the local regulatory powers in Barron County would be a logical step once the comprehensive planning process is completed. Without regulatory powers, it is unlikely that communities would be able to achieve the goals and objectives they establish in their comprehensive plans. From a legal standpoint, the strongest and most defensible

land use planning occurs when comprehensive plans and regulatory powers, such as zoning and subdivision ordinances, are developed to be mutually supportive. Land use controls can be applied to avoid or minimize potential negative indirect effects of the US 8 EIS alternatives before mitigation is needed.

#### 4.3.3.4 Access Management

Access management is planning the number and location of driveways and intersections along arterials and collectors to help maintain safe, efficient movement of traffic and to provide safer access to and from adjacent property. WisDOT uses a number of tools to manage access to state and US highways ranging from developing highway access plans to outright purchase of access if needed. Many of the tools WisDOT uses are granted to it through state statutes.

Counties can also manage access along county routes using similar authority to WisDOT's. Local communities can use access management methods such as permitting, driveway consolidation, relocation, and other tools to preserve the function of the local road system. Access management ensures that new development and/or land use changes occur in a manner that is consistent with long-term sustainability and sound access management principles.

#### 4.3.3.5 Property Acquisition

Property acquisition can be used by local public and private agencies to protect areas from unwanted development or land use change. Property can be obtained in its entirety through fee-simple purchase. Another strategy is through the purchase of individual rights that are tied to the property including the development rights. Common tools used in the acquisition of property or property rights include:

- Fee-Simple Purchase–Land trusts, government entities, or non-profit agencies purchase land in order to preserve it in perpetuity. Land is typically donated to a state or county agency for long-term maintenance.
- Conservation Easement–A legal agreement between a landowner and a land trust or government agency that permanently limits uses of land to protect a natural or other resource. The property owner retains title to the land but loses certain rights (such as development).
- Purchase of Development Rights (PDR)–A legal agreement between a landowner and a government agency where only the right to develop the land is purchased for an approximation of the market value. Similar to conservation easements, the landowner retains title to the land.
- Transfer of Development Rights (TDR)–Within a municipality, sending and receiving zones are identified where a land owner in a receiving zone purchases development credits from a landowner in a sending zone. Once the development rights are purchased from the land in the sending zone, no development can occur on the land.

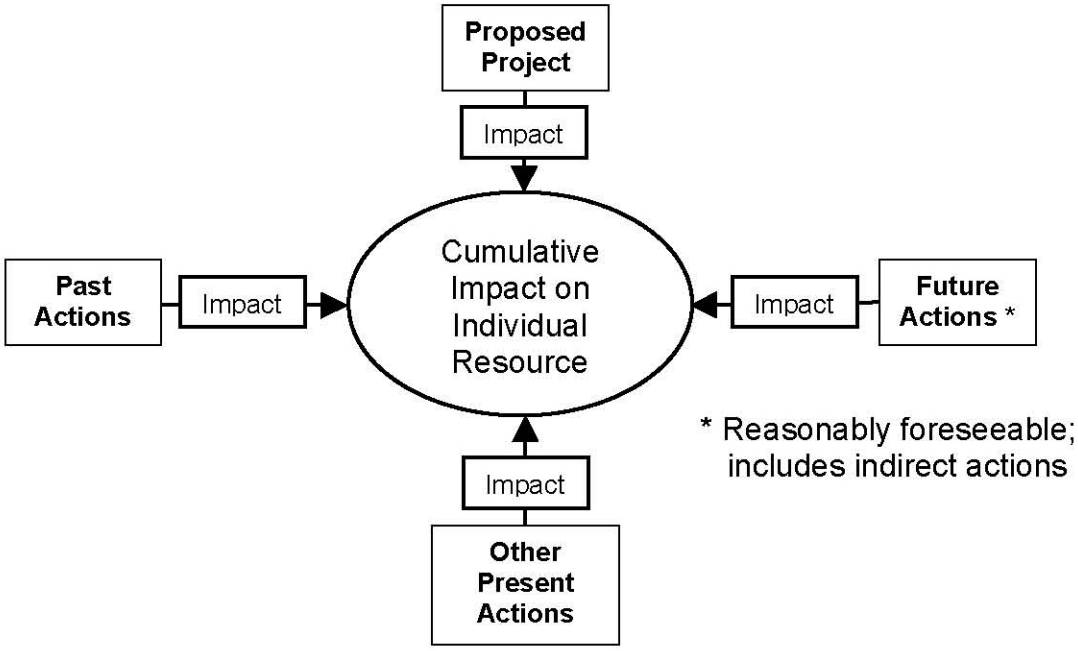
### 4.3.4 Cumulative Effects

The Council on Environmental Quality (CEQ) regulations (40 CFR § 1508.7) defines cumulative effects as: "…the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The cumulative effects of the US 8 EIS alternatives are discussed in the greater context of other activities that have occurred both in the past as well as those expected in the future (see figure 4.3.4-1). The discussion of potential cumulative effects parallels the direct effects to the natural environment that have been previously identified in Section 4.1. Direct effects that have been previously identified include:

- Acquisition or conversion of natural areas, wetlands, and farmland into highway facilities and/or future right-of-way.
- Additional crossings of the Cattail Trail in the vicinity of the village of Turtle Lake.
- Right-of-way impacts to Joel Marsh Wildlife Area and the Deer Lake Conservancy.
- Removal of shoreland and wetland vegetation.
- Increased sedimentation and alteration of stream hydrology from construction activities and structures.
- Alteration of wetland communities and fragmentation of wildlife habitats.
- Loss in soils of prime agricultural value.
- Increased noise in some areas.
- Changes to air quality.

The methodology using the EP/DS for the indirect effects analysis was established in Fall 2003 based on the state of practice at that time. It did not specifically include or recommend a process to identify and address the potential cumulative effects of the US 8 EIS alternatives. The sections that follow include the study team's estimation of potential cumulative effects of the alternatives based on the direct and the indirect effects discussed in Section 4.3.2. A more comprehensive evaluation of cumulative effects will be conducted in subsequent EIS Tiers once a Preferred Alternative has been recommended and a construction schedule identified. Later US 8 EIS Tiers will include more precisely defined improvements, updated status of local comprehensive planning efforts, and greater knowledge of the potential direct impacts.




*Source: NCHRP Report 403*
**Figure 4.3.4-1 Land Use Decisions and Development Factors**

#### 4.3.4.1 Past Actions

US 8 has experienced incremental (short-term) improvements over the past several decades including intersection improvements, the addition of passing lanes on some segments in both counties, and construction of a five-lane two-way-left-turn-lane (TWLTL) in the city of St. Croix Falls in 1985. These modifications have improved safety and operations on the corridor as well as preserving the existing capacity. In addition, land use patterns over the past two decades have included sporadic residential development with commercial development located along transportation corridors and at the fringes of the village of Turtle Lake and the city of Barron.

In Barron County, the city of Barron is the largest urbanized community in the study area. Past projects (including state and local activities) in Barron County and in the vicinity of the city of Barron include:

- The establishment of statutory access control along US 63 through Wis. Stats. 84.25 within the past 2 years.
- Passing lane improvements of US 8 between the village of Turtle Lake and the village of Almena in 2001.
- US 53 capacity expansion south of village of Haugen in 1970's.
- Realignment of WIS 25 north and south of US 8 in 1992 and 1998.
- Development of the Barron County Justice Center on the northwest side of the city of Barron, initiated in 2003.
- Upgrades to the wastewater treatment plant in 1984, 1991, and 2000.
- A new subdivision adding 40 residential lots to the south side of the city in 1992.
- Storm water and utility projects providing service to areas north of the city in 1988, 2000, and 2005.

Past projects, both state and local, in Polk County include:

- The establishment of statutory access control along US 63 through Wis. Stats. 84.25 within the past 2 years.
- Passing lane improvements of US 8 between Apple River and Turtle Lake in 2002 to 2003.
- Construction of a 5-lane Two-Way-Left-Turn-Lane (TWLTL) section of US 8 in the city of St. Croix Falls between WalMart and WIS 35 in 1985.
- Construction of a 5-lane Two-Way-Left-Turn-Lane (TWLTL) section of US 8 in the city of St. Croix Falls between the St. Croix River and WalMart in 1995.
- Construction of the St. Croix Casino & Hotel in the village of Turtle Lake in early 1990's.
- Planned Unit Development overlay zone on the northeast side of the village of Turtle Lake currently starting construction (commercial and mixed uses).

Other major highway improvements and studies in the region were located at both the eastern and western termini of the US 8 EIS project limits (Section 3.4) and include a corridor study of US 8 between Barron and Lincoln Counties, a US 8 bypass/realignment study around the village of Cameron, and a MnDOT Trunk Highway 8 Study that looked at safety, operations, and capacity improvement alternatives for US 8 between Wisconsin and the Twin Cities.

#### 4.3.4.2 Present and Future Actions

Future actions include activities that are "reasonably foreseeable" and combined with the US 8 EIS alternatives could present cumulative effects within the study area. These types of actions include future policy and development decisions that could be influenced by the US 8 EIS and other transportation studies/projects occurring in the area.

In Barron County, the city of Barron has plans for future activities including:

- US 53 study and freeway conversion through Wis. Stats. 84.295 from 26$^{th}$ Ave. to Barron/Washburn County Line (2006–2008).
- US 8 bypass construction of the village of Cameron within next 5 to 10 years.
- Airport expansion and industrial park improvements.
- Improvements to Mill Street and extension of Olson Avenue accessing new developments north of the city.
- New water tower to provide expanded capacity for new development on the city's northwest side.
- New electrical substation and electrical system upgrades.

Future actions in Polk County that could also affect land use and transportation and have a cumulative effect with the US 8 EIS potential improvements include:

- Potential capacity expansion project along WIS 35 within next 5 years.
- Additional 160 acres (64.7 ha) of commercial land available for development located west of the village of Turtle Lake.
- Development of industrial lands south of US 8 and on the west side of the village of Turtle Lake.

#### 4.3.4.3 Potential Cumulative Effects

Within the study area, water resources, agricultural land, upland areas including natural areas, and wildlife habitats could be potentially affected by cumulative effects of past, present, and future actions, as well as the US 8 EIS proposed highway improvements. The rate at which these effects manifest within the study area is dependent upon selection of the US 8 EIS Preferred Alternative and other current and proposed activities occurring in the area.

It is difficult to determine the incremental effect the US 8 EIS alternatives could have in reference to the cumulative effect of other past, present, and future actions in part because of a lack of historic environmental data indicating a possible level of change that could occur to the affected resources. When completed, local comprehensive plans and associated land use controls could improve local land use decision making, reducing the potential for cumulative effects.

Cumulative effects analysis in this stage, once a US 8 Preferred Alternative is selected, could include discussion on the following effects to these resources:

A. Water Resources, Floodplains, and Wetlands

- Acquisition and/or conversion to other land uses.
- Disruption of shore land vegetation from development.
- Alteration of wetland communities.
- Decreased water quality caused by runoff and sedimentation from local roads.
- Loss in wetlands and associated storage capacity and water filtering capabilities.
- Potential for increased flooding as a result of new construction.

B. Wildlife Habitat (Upland Forests, Woodland Openings)

- Acquisition and/or conversion to other land uses.
- Increased fragmentation of wildlife corridors.
- Increased fringe area habitat from land use changes.
- Changes to wildlife corridors and movement patterns.
- Encroachment of wildlife habitat by residential and commercial development.

C. Agriculture

- Acquisition and/or conversion to other land uses.
- Increased farmland severances and strip taking.
- Loss of farmland and cropland from land use changes.
- Loss of farm buildings and agriculture support facilities.
- Changes in the movement of agricultural equipment and products.

#### 4.3.4.4 Summary of Cumulative Effects

Cumulative effects of the US 8 EIS alternatives could include effects to water resources, wetlands, floodplains, wildlife habitat, and agricultural land. Cumulative effects should be further evaluated in later tiers of the US 8 EIS and after a Preferred Alternative is chosen. The recent planning efforts of communities within the study area, and the refinement of the Preferred Alternative in later EIS Tiers should allow for a more accurate estimate of cumulative effects.